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EXAMINER	
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ART UNIT	PAPER NUMBER
2816	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/570,050	FAN, YIPING	
	Examiner	Art Unit	
	DINH T. LE	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 January 2010_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-6,9-18 and 21-25_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6, 9-18 AND 21-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL REJECTION

Claim Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-6, 9-12, 14-18, 21 and 24-25 are rejected under 35 USC 103 (a) as being unpatentable over Hwang et al (US 6,678,511).

Regarding claims 1 and 11, Hwang et al discloses in Figures 1-9 a filter circuit comprising:

- at least two cascading filters of different orders including a second filter (12 in Figure 7) being coupled to a main filter (20 in Figure 7) and having pass-band ripples with respect to signal gain of the respective filter at frequencies in a pass-band of the respective filter and nearly equal in magnitude and out of phase with respect to each other in order to minimize a pass-band ripple in the composite filter, see Figure 3. Wherein the main filter (20) of the cascading filters is the nine stage band pass filter, see lines 64-65 column 4, and the filter (12) is selected in favor of two or four stages, see lines 5-25, column 5. Thus, the orders of the main filter (20) is higher than the orders of the second filter (12) since the main filter (20) has more stages (orders) than the second filter (12).

Regarding claims 2 and 12, wherein the magnitude of the pass-band ripples in the at least two cascading filters (12, 20) are equal.

Regarding claims 4 and 14, wherein at least one of the at least two cascading filters (12, 20) comprises an analog filter.

Regarding claims 5 and 15, wherein at least one characteristic of the at least two cascading filters (12, 20) is selectable to minimize the pass-band ripple in the composite filter.

Regarding claims 6 and 16, wherein the at least one characteristic comprises the orders of the at least two cascading filters (12, 20), see lines 5-25 of column 5.

Regarding claims 9 and 19, wherein the at least one characteristic comprises a bandwidth of the at least two cascading filters (12, 20), see Figures 1-3.

Regarding claim 10, wherein the filter (20) is the band pass filter so that it comprises a stop-band attenuation of the at least two cascading filters (10, 20), see Figure 6c.

However, Hwang et al fails to suggest that "the orders of the two cascading filters have difference in value by exactly one" as called for in claims 1 and 11, "one filter is a third order while another filter is the fourth order" as called for in claim 21, and "the combined ripples are less than .01dB at around 7.8 MHZ" as called in claim 24.

Although Hwang does not specify that the difference between the orders of the filters (12) and (20) in a value of exactly one as claimed; however, Hwang et al suggest on lines 5-9, column 5, that the number of stages (orders) of the second filter (12) can be increased or

decreased according to the performance of the main filter (20) and the repeater system, and the second filter (12) can be implemented in any number stages, *preferably* in the even stages such as two of four stages, see lines 13-17 of column 5. Thus, the order of the second filter (12) is selected based on the performance of the main filter (20) and the system in which the circuit of Hwang is to be used. Since the filter of Hwang can be used in different systems, selecting the optimum orders for the filters (12) and (20) of Hwang et al to have the optimum orders differences in exactly one is considered to be a matter of an electrical design expedient for an engineer depending upon the particular application and the particular system in which the filter circuit of Hwang et al is to be used. It would have been obvious to a person having skill in the art at the time the invention was made to select optimum orders for the filters (12) and (20) of Hwang as claimed for the purpose of accommodating with the performance of the main filter in a predetermined system so that the distortion in the passband of the filter would be corrected.

Regarding claims 21 and 24, although Hwang et al fails to suggest that the orders of the filters are third and fourth as called for in claim 21 and a combined frequency response has a peak ripple less than about .1 dB at 7.8 MHZ as called for in claim 24; however, as well known in the art, the bandwidth of a filter is determined by its orders, i.e., a filter with higher orders would provide a bandwidth wider than the bandwidth of a filter with lower orders. A skilled artisan recognizes that the filter circuit of Hwang et al can be modified to operate at the frequency of 7.8MHZ by selecting the components of the filters and the magnitude of the

combined ripple of the modified filter circuit of Jeanjean et al can be achieved about .01 dB at frequency 7.8MHZ by adjusting the complementary ripples to cancel out the ripples of the main filter. Thus, selecting the orders and the operating frequency for the modified filter circuit of

Hwang et al or adjusting the complementary ripples to optimize the combined ripples as claimed are considered to be a matter of an electrical design expedient for an engineer depending upon the particular application and the particular system in which the modified circuit of Hwang et al is to be used. Lacking of showing any criticality, it would have been obvious to a person having skill in the art at the time the invention was made to select the orders and the operating frequency for the modified filer circuit of Hwang et al and adjusting the combined ripples to a value as claimed for the purpose of increasing the bandwidth and optimizing the combined ripples at a selected frequency to accommodate with the requirement of a predetermined system.

Claims 3, 13 and 22-23 are further rejected under 35 USC 103 (a) as being unpatentable over Hwang et al (US 6,678,5110) in view of Chan et al (US 6,920,471).

Hwang et al discloses a filter circuit with all of the limitations of the claimed invention as stated above but does not disclose that at least one of the at least two cascading filters comprises a digital filter such as a finite response filter.

Nevertheless, Chanet al suggests to couple a digital filter (100) to an analog filter (12) in Figure 3 for the purpose of compensating for absolute sampling and digital delays associated with the matching circuit. See the Abstract.

It would have been obvious to a person having skill in the art at the time the invention was made to replace the analog type of the second filter (10) of Hwang et al with a digital type as suggested by Chan et al for the purpose of compensating for the absolute sampling and digital delays associated with a matching circuit of the filters.

Also, as well known in the art, the digital filter such as IIR and FIR performs the same function as the analog filter at with the exception of that the digital filter handles digital input signal and can be tuned with the digital input signal while the analog filter handles the analog input signal. Thus, selecting the digital signal for the circuit of Hwang et al to handle the digital input signal and can be digitally tuned is considered to be an electrical design expedient for an engineer for an engineer depending on an a particular application that would have been obvious at the time of the invention.

Claims 1-2, 4-6, 9, 11-12, 14-16, 18, 21 and 24 are rejected under 35 USC 103 (a) as being unpatentable over Jeanjean et al (US 6,954,119) in view of Hwang et al (US 6,678,511).

Regarding claims 1 and 11, Jeanjean et al discloses in Figure 3 a filter circuit comprising:

- at least two cascading filters of different orders including a third order filter (21) being coupled to a second order filter (20); and

- wherein the orders of these filters (20, 21) differ in value by exactly one.

Regarding claims 4 and 14, wherein at least one of the at least two cascading filters (20,21) comprises an analog filter.

However, Jeanjean et al fails to suggest that the passband of the second order filter having passband ripples with respect to signal gain of the respective filter at frequencies in a pass-band of the respective filter and nearly equal in magnitude and out of phase with respect to each other in order to minimize a pass-band ripple in the composite filter.

Nevertheless, Hwang et al suggests to employ the complementary ripples of the second filter (12) in Figures 1-7 to counter the ripples of the main filter (20) for correcting the distortion in the pass band of the main filter, see lines 5-15, column 1.

It would have been obvious to a person having skill in the art at the time the invention was made to the employ the complementary ripples as suggested by Hwang et al in the circuit of Jeanjean et al for the purpose of correcting the distortion in the passband of the filter.

Regarding claims 2, 5-6, 9, 12, 15, 16 and 18, wherein the magnitude of the pass-band ripples in the at least two cascading filters (20, 21) of the modified circuit of Jeanjean et al would be equal.

Regarding claims 21 and 24, although Jeanjean et al in view of Hwang et al fails to suggest that the orders of the filters are third and fourth as called for in claim 21 and a combined frequency response has a peak ripple less than about. 1 dB at 7.8 MHZ as called for in claim 24; however, as well known in the art, the bandwidth of a filter is determined by its orders, i.e., a filter with higher orders would provide a bandwidth wider than the bandwidth of a filter with lower orders. A skilled artisan recognizes that the modified circuit of Jeanjean et al can be

modified to operate at the frequency of 7.8MHZ by selecting the components of the filters and the magnitude of the combined ripple of the modified filter circuit of Jeanjean et al can be achieved about .01 dB at frequency 7.8MHZ by adjusting the complementary ripples to cancel out the ripples of the main filter. Thus, selecting the orders and the operating frequency for the modified filter circuit of Jeanjean et al and adjusting the complementary ripples to optimize the combined ripples as claimed are considered to be a matter of an electrical design expedient for an

engineer depending upon the particular application and the particular system in which the modified circuit of Jeanjean et al is to be used. Lacking of showing any criticality, it would have been obvious to a person having skill in the art at the time the invention was made to select the orders and the operating frequency the modified filer circuit of Jeanjean et al and adjusting the combined ripples to a value as claimed for the purpose of increasing the bandwidth and optimizing the combined ripples at a selected frequency for a predetermined system.

Response to Applicant's Arguments

The Appellant argues that “the Examiner has not provided evidence that suggests that experimentation with such ripple characteristics would lead the skilled artisan to filters differing by exactly one and the Hwang et al reference does not provide any direction for the skilled artisan to experiment with the orders of the filters. Thus, the experimentation suggested by the Examiner is an improper application of the "obvious to try" standard which would unduly include trying each of numerous possible choices of filter orders with no direction as to which of the many possible choices is likely to be successful time of the invention. No evidence is provided to suggest how a skilled artisan would work toward reaching the Examiner's conclusion. For the Examiner to maintain the rejection on the evidence provided, the Examiner would have to conclude that an infinite number of filter combinations are obvious in view of only a few concrete filter circuit examples. The arguments are not persuasive because Hwang et al suggest in Figures 6C-7 to place a second filter (12) after the main filter (20) for canceling the

ripples in the passband of the filter. Clearly, Hwang et al suggest on lines 5-9 and 13-17, column 5, that the number of stages (orders) of the second filter (12) can be implemented in any number which is different from the orders number of the main filter (20), *preferably* in the even stages such as two, which is increased or decreased in accordance with the performance (ripples) of the main filter (20). Since the filter circuit of Hwang et al is used in different system and in different environment, selecting the optimum orders numbers for the filters (12) and (20) of Hwang et al to have the order difference in exactly one as claimed for the purpose of optimizing the cancellation of ripples in a system is considered to be a matter of an electrical design that would have been obvious at the time of the invention.

The applicant argues "if the proposed modification or combination of the prior art would

change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *primafacie* obvious." Accordingly, the Examiner's apparent suggestion to modify the filter of the ' 119 reference in some manner renders the *rejection prima facie* invalid. The arguments are not persuasive because the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v.*

Teleflex, Inc., 550 U.S. 398, 82 USPQ2d 1385 (2007). In particular, modifying the circuit of Jeanjean et al as suggested by Hwang et al does not change the principle of the operation of the filter since the suggestion of Hwang et al is to improve the performance of the filter by reducing ripples in the filter passband.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DINH T. LE whose telephone number is (571) 272-1745. The examiner can normally be reached on Monday-Friday (SAM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan, can be reached at (571) 272-1988.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/DINH T. LE/

Primary Examiner, Art Unit 2816